# http://www.ric.edu/webcommunications/images/SealWithText_Small_Black.pngUNDERGRADUATE CURRICULUM COMMITTEE (UCC)PROPOSAL FORM

## Cover page scroll over blue text to see further important [instructions](#instructions): [if not working select “COMMents on rollover” in your Word preferences under view] please read these.

**N.B. DO NOT USE HIGHLIGHT, where choices are given within categories, please DELETE those THAT DO NOT APPLY TO YOUR PROPOSAL. Do not delete numbered categories.**

**ALL numbers in section (A) to be completed, including the impact ones (#5-7), put “none” if that is the case.**

|  |  |  |
| --- | --- | --- |
| A.1. [Course or program](#Proposal) | **MGT 249: Business statistics II** |  |
| [Replacing](#Ifapplicable)  |  |
| A.2. [Proposal type](#type) | **Course: revision**  |
| A.3. [Originator](#Originator) | **Julie Urda** | [Home department](#home_dept) | **Management & Marketing** |
| A.4. [Context and Rationale](#Rationale)  | **MGT 249 Business Statistics II is continuation of Business Statistics I (Math 248 or Math 240 or equivalent from other Higher education institutions).****The objectives of MGT 249 are:** **1) Application of statistical tools to various business environments for problem solving and improvement purposes.** **2)Managerial decision making based on analyzed data** **Considering there could be couple of semesters between Stat I and MGT 249, initially selected sections from Business Statistics I will be reviewed to refresh students’ knowledge on past studied Statistics course.** **The focus of MGT 249 will be on Inferential Statistics used for Interval Estimates, hypotheses testing, Regression analyses, SPC, Process Capability process/product improvement. Covering distribution of averages and proportions, which are foundations to inferential statistics, the course will start with Confidence Intervals and quickly move to hypotheses testing. Various business scenarios will be analyzed for decision making using the two above mentioned tools. Then will be a shift to forecasting for business decision making applying Simple Regression, Multiple Regression and time series. For quality control and continues improvement in business environment Statistical Process Control (SPC) tools such as control charts & Process capability ratios are analyzed.** **Throughout the course we demonstrate the theory associated with each module then demonstrate numerous applications of each module.** **The Management and Marketing majors require Math 177 and Math 248 as cognates. These requirements also fulfill General Education requirements in Mathematics and AQSR. However, many Management & Marketing majors take or receive transfer credit for Math 240 (which is substituted for the MATH 248 requirement), which, like Math 248 qualifies as a prerequisite for MGT 249. However, unlike Math 248, Math 240 does not qualify as an AQSR, only a Mathematics General Education requirement. This means students who have credit for Math 240 can take MGT 249 which is a requirement for their major, but then have to take another quantitative course to fulfill their AQSR. They find this to be an unfair burden, considering the large credit requirements in the Management and Marketing majors. We propose making MGT 249 an AQSR option so students who use Math 240 as their Mathematics General Education requirement can then use MGT 249 as their AQSR when they take it as a requirement for their Management or Marketing major.****MGT 249 qualifies as AQSR because students have to take either Math 240 or Math 248 as a prerequisite.****The addition of MATH 241 to the prerequisite is to keep in line with MATH department practice whereby students cannot take both MATH 241 and MATH 445, as MGT 249 is also a second statistics class that is equivalent to these.****Also to clarify to students taking the course the description will now begin “**A continuation of MATH 240 or MATH 248” |
| A.5. [Student impact](#student_impact) | **It will make it easier for Management and Marketing students who have taken Math 240 to complete their general education requirements by double counting a course already required for their major rather than having to take an extra AQSR course.** |
| A.6. [Impact on other programs](#impact)  | **Adds another course option from the School of Business to the AQSR General Education requirement.**  |
| A.7. [Resource impact](#Resource) | [*Faculty PT & FT*](#faculty):  | **Potential increase to students in MGT 249 classes from outside the Management and Marketing majors but these numbers estimated to be minimal.** |
| [*Library*:](#library) | **None** |
| [*Technology*](#technology) | **None** |
| [*Facilities*](#facilities): | **None** |
| A.8. [Semester effective](#Semester_effective) | **Spring 2020** | A.9. [Rationale if sooner than next Fall](#Semester_effective) | **Students graduating spring 2020 would benefit if MGT 249 could be counted as an AQSR right away.** |
| A.10. INSTRUCTIONS FOR CATALOG COPY: This single file copy must include ALL relevant pages from the college catalog, and show how the catalog will be revised. (1) Go to the “Forms and Information” page on the UCC website. Scroll down until you see the Word files for the current catalog. (2) Download ALL catalog sections relevant for this proposal, including course descriptions and/or other affected programs. (3) Place ALL relevant catalog copy into a single file. Put page breaks between sections and **delete any catalog pages not relevant for this proposal**. (4) Using the track changes function, revise the catalog pages to demonstrate what the information should look like in next year’s catalog. (5) Check the revised catalog pages against the proposal form, especially making sure that program totals are correct if adding/deleting course credits. If new copy, indicate where it should go in the catalog. If making related proposals a single catalog copy that includes all is acceptable. Send as a separate single file along with this form. |

B. [NEW OR REVISED COURSES](#delete_if)  **DO NOT use highlight. Do not delete numbered categories, just leave blank if they do not apply. Delete this whole page if the proposal does not include a new or revised course. Always fill in b. 1 and B. 3 for context.**

|  | Old ([for revisions only](#Revisions))ONLY include information that is being revised, otherwise leave blank.  | NewExamples are provided within some of the boxes for guidance, delete just the examples that do not apply. |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title)  | **MGT 249** |  |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title)  | **Business Statistics II** |  |
| B.4. [Course description](#description)  | A continuation of MATH 248, emphasis is on applied statistics, both parametric and nonparametric. Students cannot receive credit for both MGT 249 and MATH 445. | A continuation of MATH 240 or MATH 248, emphasis is on applied statistics, both parametric and nonparametric. Students cannot receive credit for both MGT 249 and either MATH 241 or 445. |
| B.5. [Prerequisite(s)](#prereqs) | **Math 240 or Math 248** |  |
| B.6. [Offered](#Offered) | **Fall | Spring | Summer |** |  |
| B.7. [Contact hours](#contacthours)  | **4** |  |
| B.8. [Credit hours](#credits) | **4** |  |
| B.9. [Justify differences if any](#differences) |  |
| B.10. [Grading system](#grading)  | **Letter grade**  |  |
| B.11. [Instructional methods](#instr_methods) | **| Lecture**  |  |
| B.12.[Categories](#required) | **Required for major**  |  |
| B.13. Is this an Honors course? | **NO** |  |
| B.14. [General Education](#ge)N.B. Connections must include at least 50% Standard Classroom instruction. |  **NO**  | **YES category: AQSR** |
| B.15. [How will student performance be evaluated?](#performance) | **Attendance | Class participation | Exams | Papers |** |  |
| B.16 [Recommended class-size](#class_size" \o "Check appendix XVIII in the UCC Manual for Best Practices) | **30** |  |
| B.17. [Redundancy statement](#competing) |  |  |
| B. 18. Other changes, if any |  |

| B.18**.** [**Course learning outcomes**](#outcomes)**: List each one in a separate row** | [**Professional Org.Standard(s)**](#standards)**, if relevant** | [**How will each outcome be measured**](#measured)**?** |
| --- | --- | --- |
| *Critical and Creative Thinking:* Students will be able to analyze and interpret information from multiple perspectives, question assumptions and conclusions, and understand the impact of biases, including their own, on thinking and learning. |  | Students learn how to apply statistics and mathematical models to real-world business situations. For example, lesson number one considers how statistics can be used to predict the next president. Other practical applications include collecting and classifying data; analyzing and interpreting distribution data; comparing samples statistically; and analyzing qualitative data. All of these methods include instruction on how to make models to reduce bias. There are also lessons randomizing to reduce sampling bias. Students learn how to read the results of many statistical analyses (see outline attached) and how to interpret data so they may make accurate business decisions. |
| *Quantitative Literacy:* Students will demonstrate the ability to: (1) interpret and evaluate numerical and visual statistics; (2) develop models that can be solved by appropriate mathematical methods; and (3) create arguments supported by quantitative evidence and communicate them in writing and through numerical and visual displays of data including words, tables, graphs, and equations. |  | (1) Students learn to interpret and evaluate continuous quantitative data; discreet data; various distributions; distribution means; confidence intervals; variance; standard deviations; F-Tests; Chi-squares; tests for significance; and correlations.(2) Students develop models for testing single-sample and two-sample hypotheses; linear regressions; and multiple regressions. They also learn how to interpret the models and their results and make statistical predictions using them.(3) In order to accomplish (2), students learn how to create hypotheses for testing and then write interpretations of hypothesis testing that support or dispute the hypotheses. This includes the proper way to write regression equations; use of Minitab to produce statistical tables for displaying the results of analyses; and written analyses of these results. |
| *Scientific Literacy:* Students will understand how scientific knowledge is uncovered through the empirical testing of hypotheses; be familiar with how data is analyzed, scientific models are made, theories are generated, and practical scientific problems are approached and solved; have the capacity to be informed about scientific matters as they pertain to living in this complex world; be able to communicate scientific knowledge through speaking and writing. |  | 1- Students will learn the conceptual meaning of all statistical formulas. They’ll know how formulas were developed and where to apply them. 2- Students will practice proving some theoretical formulas. I.e.; using a set of provided data they’ll prove Central Limit Theorem, by developing these experiential formulas for average and standard error of estimate for distribution of averages. 3- They’ll use the developed equations for inferential statistics all through the course. 4- The emphases in this course will be Inferential Statistics. 5- They compare quantitative and discrete characteristics of identical products from different producers and make business decisions on their performance. 6- The newly added topic of Statistical Process Control (SPC) to this course, will directly show application of statistics to Quality Control/Assurance in Business. 7- Students will use Microsoft excel as a tool to forecast future demand or sales for business, applying time series formulas. The nature of time series formulas will be discussed and taught before applying excel. |

| B.19. [**Topical outline**](#outline)**: DO NOT INSERT WHOLE SYLLABUS, JUST A TWO-TIER TOPIC OUTLINE. Proposals that ignore this request will be returned for revision.** |
| --- |
| 1. **Review of confidence intervals – means and proportions**
2. **Sample size determination with confidence and error selected**
3. **Hypothesis testing with all its implications – one and two tailed tests, t, z, and F tests, means, variances, and proportions**
4. **Use of p values**
5. **Power of tests**
6. **Tests between independent and related (dependent) populations – proportions and means**
7. **Analysis of Variance**
8. **One-way randomized**
9. **Two-way randomized (blocked)**
10. **Factorial designs with interaction including tests to determine significance between factor levels**
11. **Chi-Square tests for goodness of fit and independence**
12. **Confidence intervals on variances**
13. **Full interpretations of dependent findings**
14. **Hypotheses on distributions**
15. **Simple linear regression**
16. **Complete explanation of concept with associated assumptions**
17. **Analysis of regression coefficient (t test); confidence interval**
18. **Reintroduction of Analysis of Variance Table**
19. **Reintroduction of F tests**
20. **Introduction of coefficient of determination (unadjusted/adjusted)**
21. **Forecasting mean and individual values with confidence intervals and prediction intervals**
22. **Introduction to correlation coefficient with hypotheses to test significance of the correlation coefficient**
23. **Pitfalls to beware with regression analysis**
24. **Multiple regression**
25. **Interpreting t and p values on coefficients**
26. **Interpreting total F and partial F statistics**
27. **More on the coefficient of determination, adjusted and unadjusted**
28. **Introduction of dummy variables**
29. **Analyzing interactions in regression models**
30. **Conducting residual analysis and testing the model’s assumptions**
31. **Predicting probabilities with logistic regression**
32. **Discussion and analyses of multicollinearity**
33. **Multiple regression model building**
34. **Discussion of theoretical versus development via correlation analyses**
35. **Introduction of forward, backward, subsets, and stepwise models**
36. **Work with estimations, predictions, and full analyses of regression models**
37. **More analyses of confidence intervals for means and single predictions**
38. **More on testing assumptions of regression models**
39. **Use of regression to analyze analysis of variance designs (one and two-way models); including forecasts from analysis of variance models**
40. **Ethical implications and issues to beware with regression analyses**
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## D. Signatures

* Changes that affect General Education in any way MUST be approved by ALL Deans and COGE Chair.
* Changes that directly impact more than one department/program MUST have the signatures of all relevant department chairs, program directors, and their relevant dean (e.g. when creating/revising a program using courses from other departments/programs). Check UCC manual 4.2 for further guidelines on whether the signatures need to be approval or acknowledgement.
* Proposals that do not have appropriate approval signatures will not be considered.
* Type in name of person signing and their position/affiliation.
* Send electronic files of this proposal and accompanying catalog copy to curriculum@ric.edu and a printed signature copy of this whole form to the current Chair of UCC. Check UCC website for due dates.

##### D.1. Approvals: required from programs/departments/deans who originate the proposal. may include multiple departments, e.g., for joint/interdisciplinary proposals.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Connie Milbourne | Chair of Management & Marketing | e-mail confirmation to curriculum@ric.edu | 3/19/2020 |
| Jeff Mello | Dean of School of Business | e-mail confirmation to curriculum@ric.edu | 3/14/2020 |

##### D.2. [Acknowledgements](#acknowledge): REQUIRED from OTHER PROGRAMS/DEPARTMENTS (and their relevant deans if not already included above) that are IMPACTED BY THE PROPOSAL. SIGNATURE DOES NOT INDICATE APPROVAL, ONLY AWARENESS THAT THE PROPOSAL IS BEING SUBMITTED. CONCERNS SHOULD BE BROUGHT TO THE UCC COMMITTEE MEETING FOR DISCUSSION; all faculty are welcome to attend.

| Name | Position/affiliation | [Signature](#Signature_2) | Date |
| --- | --- | --- | --- |
| Earl Simson | Dean Faculty of Arts & Sciences | e-mail confirmation to curriculum@ric.edu | 3/26/2020 |
| Stephanie Costa | Chair, Math & Computer Science | e-mail confirmation to curriculum@ric.edu | 3/17/2020 |
| Jim Magyar | Program Director of General Education | e-mail confirmation to curriculum@ric.edu | 3/14/2020 |
| Jeannine Dingus-Eason | Dean of FSEHD | e-mail confirmation to curriculum@ric.edu | 3/17/2020 |
| Debra Servello | Interim Dean, School of Nursing | e-mail confirmation to curriculum@ric.edu | 3/17/2020 |
| Jayashree Nimmagadda | Interim Dean, School of Social Work | e-mail confirmation to curriculum@ric.edu | 3/18/2020 |